The Changing Wetland

As with all ecosystems in temperate regions, wetlands undergo seasonal, annual and long-term changes in the condition of the vegetation, in species composition and in species dominance. During any growing season, changes in the appearance of a particular wetland may result from normal growth and maturation processes, from the sequence of flower blooming, from changes in moisture content or from changes in species dominance. Many of these types of changes are cyclic and somewhat predictable from year to year in wetlands which have reached a state of dynamic stability.

In high energy area, marshes may be less stable: eroding or accreting in different locations as a function of changing currents and storms. Although these processes normally are slow, taking many years, a single severe storm may erode away a portion of a marsh only to deposit substrate in another area where a new marsh can form. Thus nature has provided upland areas with a "plastic" fringe able to withstand storms and flooding, absorbing and dissipating much of the destructive energy and diminishing damage to the fast-land. Furthermore, this natural protection is self-regenerating, i.e. marsh vegetation will normally colonize protected areas if the substrate is at an appropriate depth. This process is facilitated when the substrate is deposited contiguous to an existing marsh or when man purposefully works to establish wetlands.

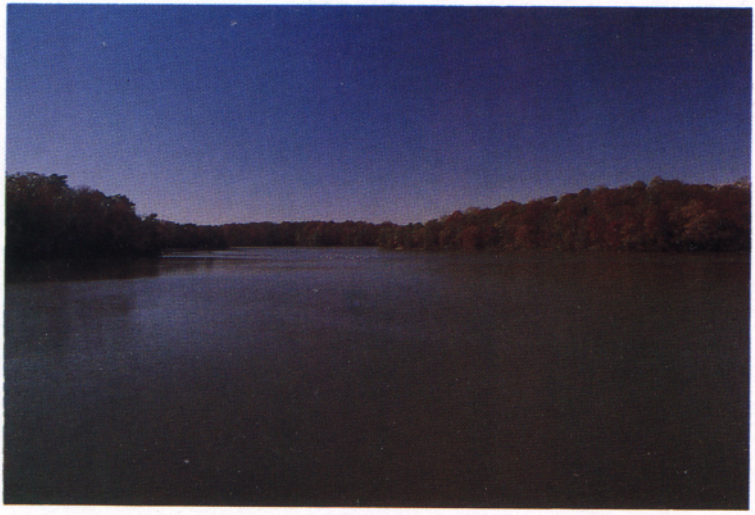
Salt marshes are often characterized by almost pure stands of one or two plant species. Such wetlands progress through a sprouting, growth, flowering, seeding and die-off seasonal cycle with differences normally restricted to the growth stages of the dominant species. Slight variations in elevation which control the degree of inundation may cause differences in the vigor of the plants (e.g. tall form-short form cordgrass), increases in diversity, or result in barren areas (e.g. salt pans where evaporation elevates the salt content).

In freshwater marshes, diversity is normally greater than the saltmarsh and dominance may change several times throughout the growing season. This is a result of differential germination, growth and flowering rates, creating somewhat predictable cycles of species dominance. Thus, an observer in Spring may characterize a marsh by species A, B and C and return to the same area in late summer or early fall and have great difficulty in finding representatives of A or B because species X, Y, and Z have become dominant. Similarly, an observer may not be able to identify some of the dominant species if the flower is not in bloom at the time of the observation.

The degree of change from season to season can be most dramatic in freshwater marshes. This is illustrated in the sequence of pictures on page 3.32 which depict a tidal freshwater marsh near Williamsburg, Va. The top exposure was taken in late fall. The second exposure was taken in winter. The bottom exposure depicts the same area from late spring through the summer. Thus, without the knowledge of local vegetational cycles, the fall or winter observer could classify this lush marsh as shallow open water.

Bogs are generally considered to be the last successional stage before upland in northern lakes and ponds. Their uniqueness from the surrounding upland vegetation and from freshwater marshes results from the forms and species of plants which dominate the community. Many of the species are remnants of the tundra biome, i.e. they are not found further south than the tundra except in bogs.

The bog presents in outward appearance, a relatively static community. The building block of the bog, sphagnum moss, changes little during the year, while the associated herbs often remain inconspicuous unless the observer is on his hands and knees. Many of the shrubs and tree species are evergreen: changing seasonally only in the presence or absence of flowers and fruits. Thus an observer should be able to identify most of dominant species during any season when snow-cover is absent.



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Other than a change in color and the falling of leaves, the freshwater wooded swamp presents a uniform appearance to the observer. Along the fringes of the swamp and at the interface with open water where sunlight is more intense, herbaceous plants thrive and undergo cyclic changes similar to the freshwater marsh. However, once under the canopy, the swamp floor may be relatively open with few shrubs and herbs. Generally, the density of undergrowth is dictated by the intensity of sunlight filtering down through the canopy: thus fallen trees or other openings in the swamp roof will produce patches of denser vegetation below. One problem that the observer faces in identifying the dominant species of the hard wood swamp is the elevation above ground level of the characteristic structures; i.e. leaves, seeds and flowers are often 15 meters or more overhead.